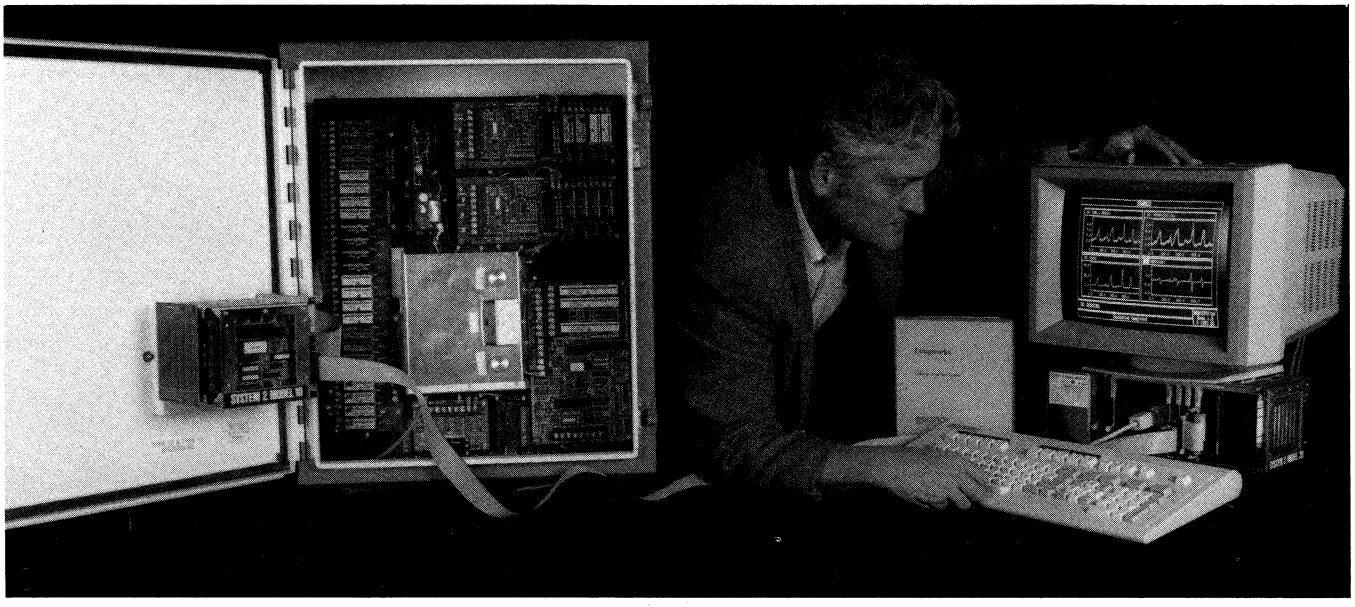
THE BUFFER

PRO-LOG® CORPORATION A Quarterly Newsletter Published by Pro-Log Corporation February 1987



Model 10 (on the door of the NEMA box) controls an industrial system. Model 20 (with 7350 EGA card, monitor, and keyboard) sends commands and receives status. So simple even President Ed Lee can use it.

SYSTEM 2 - Pro-Log's New PC/XT-Compatible Industrial Computer

--by Randy Bradley

For Rugged Applications

Pro-Log announces an integrated industrial-quality MS-DOS computer. System 2 provides a software environment comparable to an IBM PC/XT but with hardware suitable for embedding in factory-floor and other rugged applications.

Industrial Quality/Industrial Standards

Covered by a 5-year parts and labor warranty, System 2 can operate from 0 to 65°C, withstand 10 gs of shock, and have a Mean Time Between Failures (MTBF) in excess of 7 years (calculated for an average ambient temperature of 55°C). System 2 uses Microsoft's MS-DOS 3.2 operating system configured for a set of Pro-Log STD BUS cards. The cards provide the basic hardware functions required by the operating system but with environmental, reliability, and warranty specifications typically not found with PC bus cards.

Easy to Customize

System 2 can be used in applications like process control, test and measurement equipment, ground support, and data acquisition.

Applying the system is simple. System 2 provides up to 23 user expansion slots to add STD BUS cards to serve your application. System 2's hardware options include solid state, floppy and hard disk memory; EGA/CGA/monochrome graphics controller; a PC keyboard interface; IEEE-488 and Opto-22 industrial interfaces; and RS-232 and RS-422 network interfaces. All options are fully supported by built-in or ready-to-use software.

Select Your Interface

The system functions as delivered; or you can connect it to any RS-232-C interface device, such as a terminal, modem, keyboard, or computer. Our EGA Color Graphics Card with built-in keyboard port plus a monitor and keyboard, give you IBM PC/XT compatibility with rugged specifications.

PC/XT Compatible

System 2 is fully MS-DOS 3.2 compatible and supports the PC/XT BIOS interrupts. This allows you to run a wide variety of software development, application, and other programs readily available for the PC, including Word, PC Paint, and Windows.

(Continued on page 3)

At A Glance . . .

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EDITORIAL

Pro-Log Quality Program Increases MTBF

-- by Arnold Jorgensen, Guest Editor

Pro-Log design and manufacturing policies and practices are not new -- most date back to our founding in 1972. What is new is the latest reassessment of our Mean Time Between Failures (MTBF) calculations. While the MTBF figures increased, they are conservative compared to actual field data. The new MTBF figures of more than 30 years for most PWBs are calculated at an average temperature of 55°C.

Our intensive focus on quality in design, vendor and part selection, testing, and analysis has increased the MTBF figures and enabled us to extend our parts and labor warranty on STD BUS cards last year from 2 to 5 years.

Conservative Design Philosophy

Worst-case design analyzes parameters such as loading, speed, and voltage; resulting in products that continue to meet specification long after component parameters have drifted outside initial specification. All Pro-Log products are designed to meet at least 10 years "useful life."

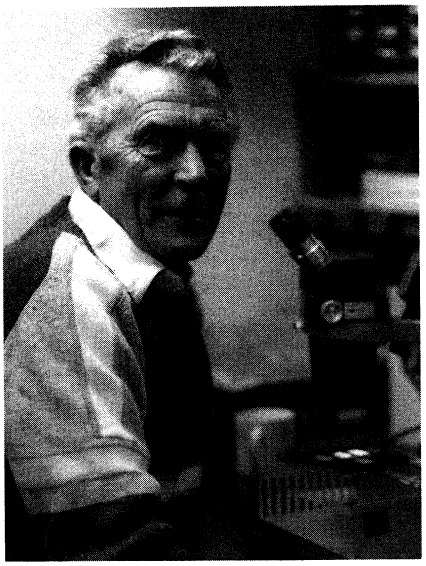
Prototypes of products are stress tested beyond the product specification to verify component selection and product design.

Vendor Selection

Manufacturers are evaluated for quality, reliability, and conformance to specification. New components are evaluated and tested before being designed into any product. Once qualified, they become standard parts that, through continual use, allow us to become very familiar with the function and parameter variances.

Computer-Aided Design (CAD)

Pro-Log uses a CAD machine for its Printed Wiring Board (PWB) designs. A CAD machine is inherently more accurate than manual layouts. Track widths and spacings are checked by the computer.



Arnold Jorgenson, Technical Director of Engineering

The CAD database is sent to the PWB vendor and is not subject to deterioration as a function of temperature, humidity, and handling as is artwork. In addition, 4-layer PWBs improve operating margins, reduces line density, and thus improve the product MTBF.

Burn-In

Pro-Log applies a power-on burn-in at 80°C to 100% of its STD BUS board products for 24 hours, followed by a functional test. This procedure reduces infant mortality and flags weak components.

Failure Reports

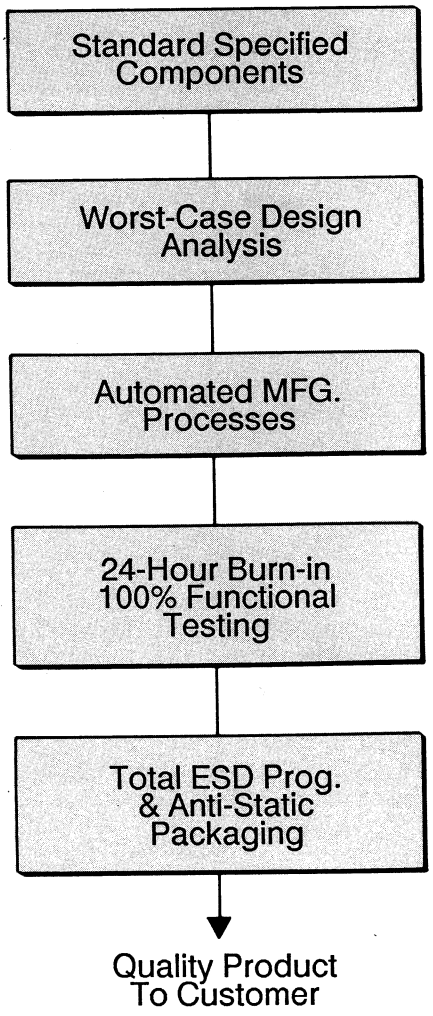
Failure reports are generated from incoming inspection, assembly, burn-in, and test. Weekly meetings are held to evaluate these reports where we analyze parameter failures, process problems, and specify corrective actions.

MTBF

Products returned to Pro-Log for warranty repairs are analyzed to determine the cause of failure. The results are added to a computer database that allows failure rates to be sorted by product and component type. The database also tracks vendors, vendor date codes, and the physical position of failed components on the product. The failures are correlated to the total number of products in the field still under warranty, which allows calculation of actual MTBF figures from the field. Failures also include infant mortality failures (first six to nine months in the field) and accidental failures caused by customers (slipped probes, etc.).

Prices Unaffected

The quality of our design and manufacturing program was directly responsible for our ability to extend our warranty from two to five years. On the average, actual field MTBF figures are three to five times better than the calculated figures we publish on our data sheets. Because extending the warranty added less than 1% to overall product costs, we were able to offer this warranty extension at no cost to the customer.


Standard Specified Components
Worst-Case Design Analysis
Automated MFG. Processes
24-Hour Burn-in 100% Functional Testing
Total ESD Prog. & Anti-Static Packaging
Quality Product To Customer

Pro-Log's New System 2 Computer

(Continued from page 1)

Table 1 lists some of the industry-standard software packages already tested on System 2.

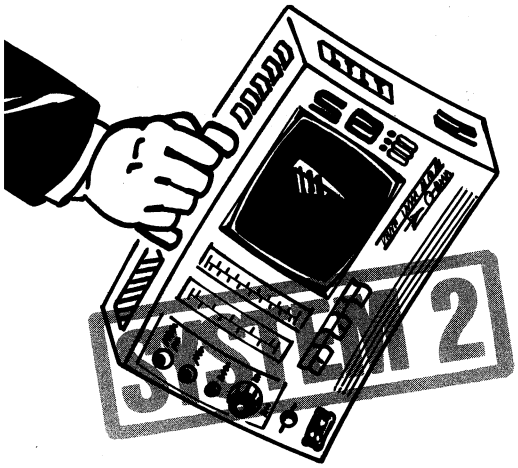
Some of the PC Software Tested on System 2

CROSSTALK (Version 3.61)
Windows (Version 1.01)
PC Paint (Version 3.00)
OrCAD (Version 1.2)
Lotus 1-2-3 (Version 1A)
dBase II 2.43
Microsoft Word 3.0
WordStar 3.30
BRIEF 1.3
QuickBASIC 2.0
PAX System 8632
Loopworks 100 (Version 2.0)

Table 1

Uses Less Power and Generates Less Heat

The STD BUS boards in System 2 use CMOS and surface mount technology to minimize power requirements and space. Consuming as little as 1.25 watts, System 2 is ideal for battery-operated portable equipment. (A handful of D-cells could power a system with semiconductor disk drives for a couple of days.) Because less heat is dissipated by System 2, it can operate in completely sealed enclosures without requiring a fan or heatsink. This reduces the size and cost of packaging and allows the system to be installed in remote sites subject to various environmental conditions.



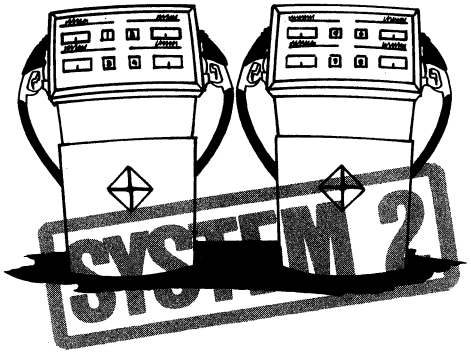
System 2 Features

* NEC V20 Microprocessor (80C88-compatible)
* 128K-byte system static RAM
* PC-compatible COM1 port (configurable as console port)
* PC-compatible Counter/Timer and Interrupt Controller
* Battery-backed Time-of-Day Clock
* MS-DOS 3.2 operating system
* Semiconductor (Model 10) or floppy disk (Model 20)
* Reset switch
* +5V indicator LED
* 3 to 23 expansion card slots for optional cards

System 2 Options:

(See pages 5 and 6)

* EGA/CGA/Monochrome Graphics
* 20-MB Hard Disk Expansion
* Distributed Control/Networking
* 8087 Math Coprocessor
* Opto-22 Interface
* IEEE-488 (GPIB) Interface
* Serial Interfaces
* Printer Interface
* Memory Expansion to 640K Bytes
* Semiconductor Disk Expansion to 7 Megabytes
* 720K-Byte Floppy Expansion



Two Models Available

To aid customization, System 2 is offered in two different models.

Model 10 provides the operating system and user program storage via solid-state (semiconductor) disk drives. It is primarily designed to be embedded in industrial control systems that must operate in harsh industrial or remote environments not suitable for mechanical disk drives. These include environments subject to high or low temperatures, dust, dirt, and other contaminants, or shock and vibration.

Model 20 is configured around floppy and hard disk drives that provide the mass storage capabilities of the PC. It is ideal for medical or engineering instrumentation, data acquisition systems, and application development. See page 4 for more details.

For More Information or a Demonstration

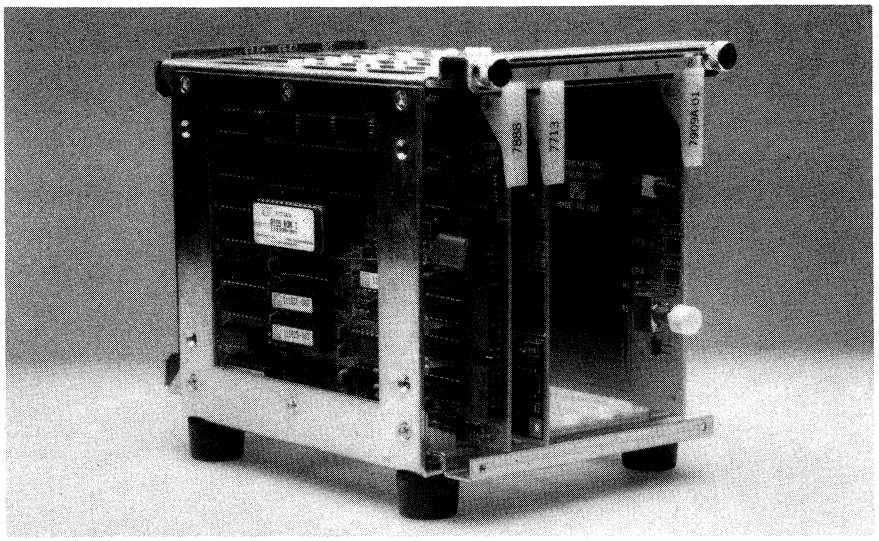
System 2 can be ordered now, with deliveries starting in March.

If you are interested in learning more about System 2, circle #1 on the reply postcard.

If you have an immediate application and would like a demonstration of System 2, call (800) 538-9570.

Model 10: A Lean and Mean Industrial Computer

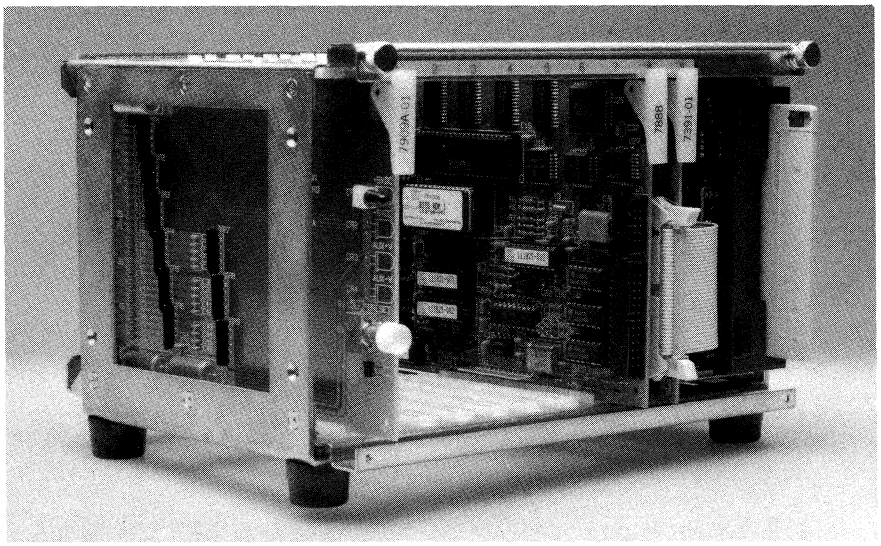
System 2 Model 10 is designed for embedding in systems where low power, wide temperature range, vibration, moisture, and airborne particles are a problem. Model 10 uses semiconductor disks because they consume less power than floppy or hard disk drives. They also provide a rugged form of mass storage that is less sensitive to temperature, dirt, and vibration.



System 2 Model 10: 7888-01 Processor Card, 7713-01 ROM Disk Card, 7909A Terminator Card, and BX-06T card rack with retaining bar.

Model 20: A Fat and Sassy Industrial Computer

System 2 Model 20 is designed for applications that need a rugged IBM PC/XT or equivalent. Model 20 provides a 720K-byte 3-1/2" floppy disk drive to load the operating system and store program and data files. Floppy disks allow you to load, remove, and transport programs and data between systems.



System 2 Model 20: 7888-01 Processor Card, 7391-01 Floppy Disk Controller Card, a disk drive, 7909A Terminator Card, and BX-09T card rack with retaining bar.

System 2 Specifications

Mean Time Between Failures (MTBF)

MTBF exceeds 7 years (calculated for an average ambient temperature of 55°C). MTBF of mechanical disk drive exceeds 12,000 power-on hours.

Mean Time To Repair (MTTR)

MTTR is typically less than 5 minutes. Replacement of mechanical disk drive is typically less than 30 minutes.

Warranty

5 years parts and labor, 6 months on mechanical disks

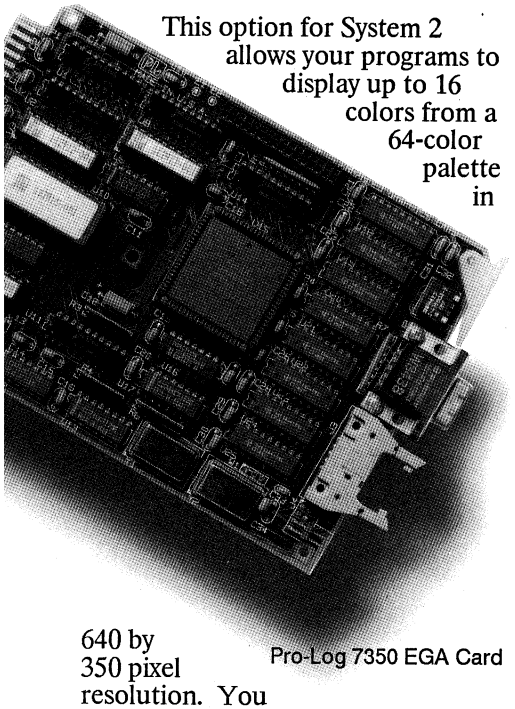
	MODEL 10	MODEL 20
Power Consumed + 5V:	0.7A max., 0.2A typ.	1.3A max., 0.80A typ.
+12V:	0.05A max., 0.010A typ.	0.2A max., 0.16A typ.
-12V:	0.05A max., 0.010A typ.	0.05A max., 0.01A typ.
Operating Temperature	0° to +65°C	5° to 45°C (limited by floppy disk drives)
Shock	10g peak acceleration in x and y axes; 7.5g peak acceleration in z axis; duration less than 10 msec; maximum frequency, 2 per second	5g peak acceleration
Vibration	1.0g peak acceleration, 10 to 500 Hz	0.5g peak acceleration, 0 to 100 Hz
Price	From $1255 with substantial volume discounts	From $1555 with substantial volume discounts

Selected System 2 Hardware Options

-- by Byron James

EGA Card

The 7350 Enhanced Graphics Adapter (EGA) Card is an IBM-PC compatible graphics card with built-in keyboard port.



Pro-Log 7350 EGA Card

This option for System 2 allows your programs to display up to 16 colors from a 64-color palette in 640 by 350 pixel resolution. You can select the monitor that best suits your needs because the 7350 is also 100% compatible with IBM CGA/MDA, Hercules Graphics, and Plantronics Colorplus standards. A port is provided to add an IBM-compatible keyboard, if desired. Installing the 7350 in System 2 is as easy as plugging it into the card rack since the 7350 contains its own BIOS extension PROM. Once installed in the system, the serial port on the 7888 CPU Card is changed from the console to a general-purpose COM1 port that you can use for a mouse, modem, or printer.

Circle #5 on the reply postcard for your copy of the 7350 data sheet.

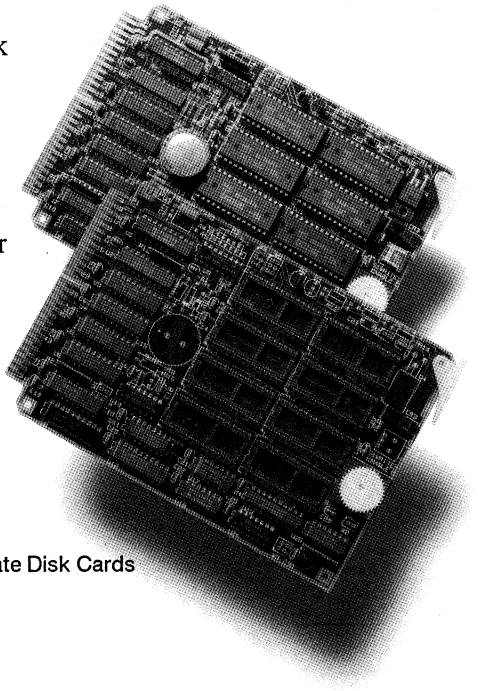
Rugged Alternatives to Mechanical Disk Drives

The 7714 and 7715 are semiconductor disk expansion cards for System 2. Up to 7 megabytes of disk space can be added to a system. Each card has a drive select switch that allows you to select the card as one of 14 unique disks. Because these cards function as floppy drives, MS-DOS allows you to use the same file transfer commands as on the PC. The semiconductor disks have no moving parts and are less susceptible to dirt, moisture, vibration, and temperature variations than mechanical Winchester and floppy drives. Standard RAM and ROM devices store the data onto these cards.

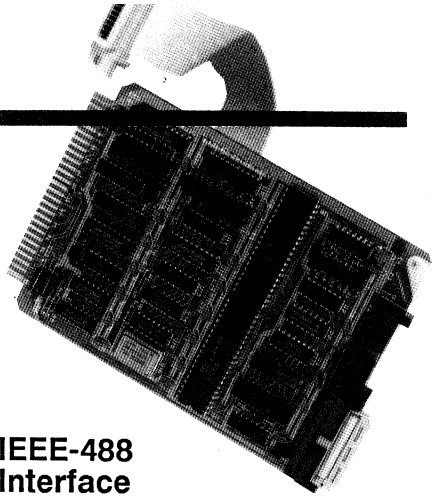
The 7714 is a 512K-byte ROM disk card that you can use for permanent storage of text editors, compilers, and debugged software.

The 7715 is a 256K-byte RAM disk card that you can use for storage of data and software while the system is running. The card has a temporary battery backup source that protects your files for a minimum of 30 minutes. To back up your data for longer periods, simply connect a battery to the VBATT line on the STD BUS.

For your copy of the 7714 and 7715 data sheets, circle #7 and #8 on the reply postcard.



Pro-Log 7714/7715 Solid-State Disk Cards



IEEE-488 Interface

The National Instruments' GPIB-961P STD BUS card implements the full range of GPIB controller functions and also supports both normal and extended talker and listener, serial and parallel poll, service request, and remote programming functions.

For a GPIB-961P data sheet, circle #11 on the reply postcard.

Additional Serial Channels

The 7312 and 7314 Communication cards allow two and four serial channels respectively to be added to System 2. Software resident in System 2 will recognize these cards and will allow the additional serial channels to be controlled through DOS commands.

For 7312 and 7314 data sheets, circle #3 and #4 on the reply postcard.

Memory Expansion Up to 640K Bytes

The 7716 CMOS static RAM cards allow system RAM on System 2 to be expanded up to 384K-bytes (one card), or 640K-bytes (two cards). CMOS static devices are used to avoid wait-states, minimize power, and extend temperature range compared to dynamic RAM technology.

For a 7716 data sheet, circle #9 on the reply postcard.

Winchester Disk Controller

The 7390 SCSI Controller card controls up to four hard disk drives. The card can be factory installed along with a 3-1/2" 20-MB Winchester in both System 2 models.

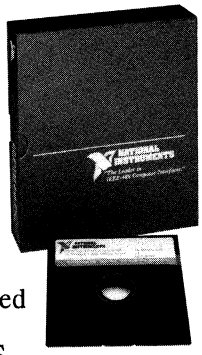
For a 7390 data sheet, circle #6 on the reply postcard.

Selected System 2 Software Options

-- by Byron James

IEEE-488 Interface

Designated the GPIB-961 STD-DOS Handler, the software provides over 30 GPIB-related functions and completely eliminates the need to understand or program, the hardware itself. The GPIB-961 STD-DOS Handler is a version of the proven MS-DOS handler developed by National Instruments for the PC, but configured for the company's GPIB-961 STD BUS card and Pro-Log's System 2.



For a GPIB-961 STD-DOS Handler data sheet, circle #11 on the reply postcard.

Process Control Without Programming

Loopworks 100

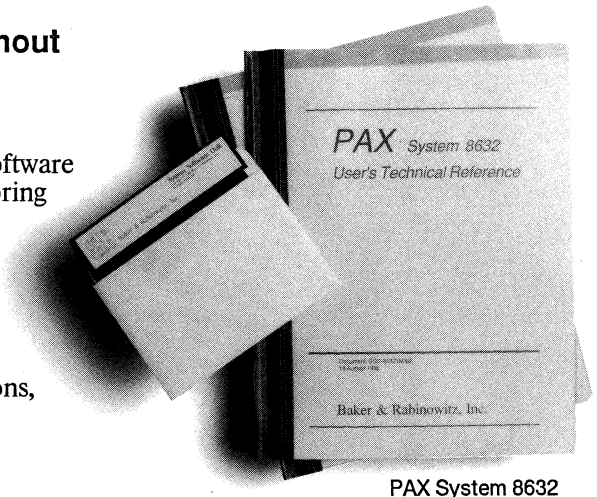
Loopworks is a PC-DOS software package for process monitoring and control that already contains the drivers to control your hardware. All you have to do is enter the parameters into tables. These parameters can be inputs, outputs, computations, and PID loops you plan to use as well as where the I/O is addressed. Loopworks does the rest by displaying this information on various screens while continuously updating the parameters as your process changes. Loopworks includes drivers for Opto-22's industrial subsystems.

Circle #12 on the reply postcard for additional literature on Loopworks.

Real-Time Multitasking Solution for MS-DOS

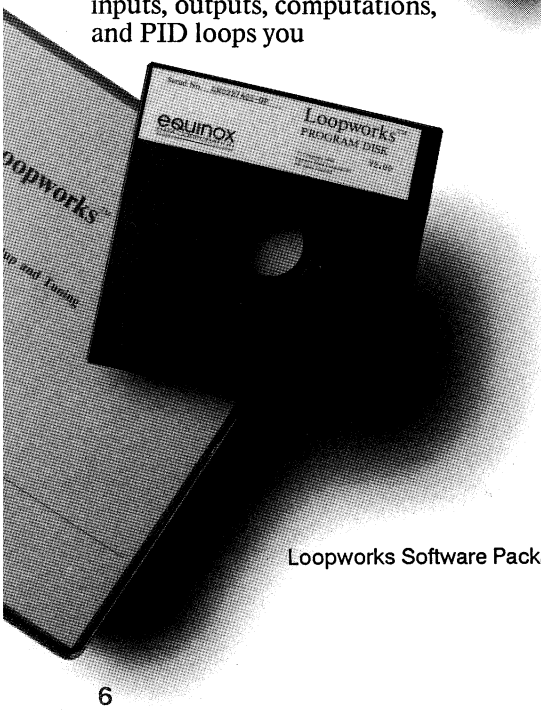
PAX System 8632

PAX allows you to create real-time multitasking software to execute up to 32 tasks concurrently. PAX can be used with Microsoft's C and Macro Assembler. Unlike other multitasking executive software, PAX is easy to use and quick to set up. Simply write each task, then instruct PAX how and when to handle them. With PAX you access all DOS function calls without re-entry problems. PAX even comes with interrupt vector management tools. Moreover, PAX has no royalty fees, is not copy protected, and is a low-cost solution.



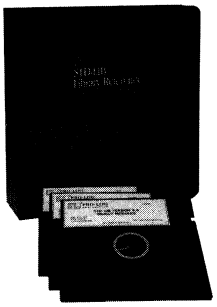
PAX System 8632

Circle #13 on the reply postcard for your copy of the PAX data sheet.



Loopworks Software Package

Software Library Speeds Integration of STD BUS I/O Cards



To aid customization, a software library of initialization and driver routines is available. The STD-LIB 2.0 Library supports 22 I/O cards that link to applications programs written with Microsoft's C, BASIC, or Macro Assembler languages. The library also includes timing and diagnostic routines.

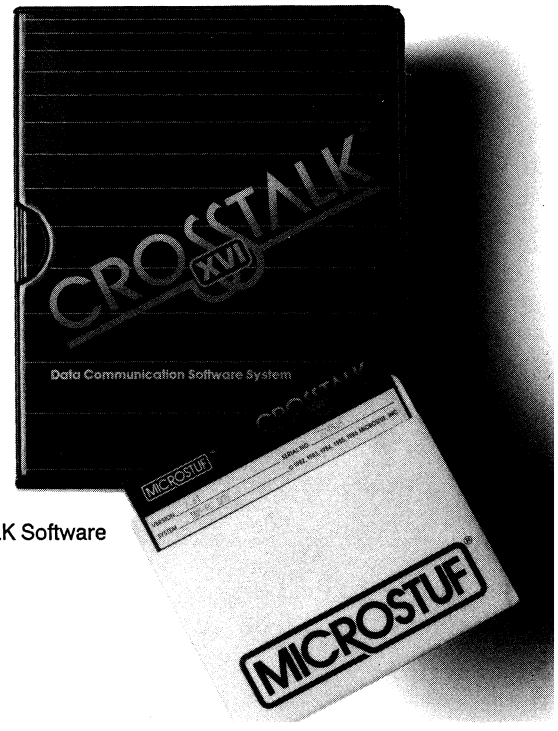
Circle #10 on the reply postcard for a copy of the STD-LIB 2.0 data sheet.

Communication Software

CROSSTALK

CROSSTALK is a complete communication program that links System 2 to other CROSSTALK-compatible computers. This link can be direct or remote, as through a modem. Using CROSSTALK, you can transfer and receive files even in noisy environments without fear of losing data because of CROSSTALK's accurate error-checking methods.

Circle #14 on the reply postcard for a copy of the CROSSTALK data sheet.



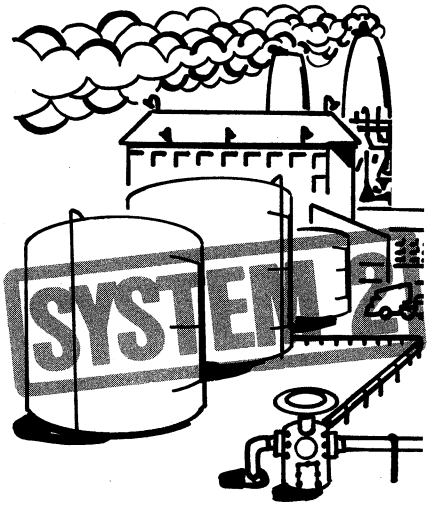
CROSSTALK Software

Upgrade for Existing STD-DOS Users

--by Paul Virgo

Owners of Pro-Log STD-DOS Prototyping Systems (PS-1.1, PS-1.2, PS-1.21, and PS-1.21H) can now upgrade to a prototyping configuration of System 2. This allows you to develop applications that take advantage of floppy disks, graphics, and PC/XT compatibility. System 2 is built with different hardware from the PS systems, so an upgrade requires replacing the equipment with a new System 2.

This offer is valid until May 15, 1987. To arrange for a trade-in, contact Pro-Log Customer Service by calling (408) 646-3617 or by circling #2 on the reply postcard.



Tradeshows

Mark your calendars. Pro-Log will be exhibiting at the upcoming tradeshows:

April 7-9, 1987 International Programmable Controller Show, Cobo Hall in Detroit, Michigan.

May 19-21, 1987 Control Expo, O'Hare Exposition Center in Rosemont, Illinois.

New Sales Representatives

New England

A change in the organization of Martindale Associates has precipitated a change in the New England representation. Tri-Logic, Inc. is a new sales organization consisting of the same salespeople who have been servicing the territory for the past few years. Martindale Distribution, Inc. continues to support the territory through Pro-Log's Domestic Distributor program.

Tri-Logic, Inc. offices include:

Connecticut and Rhode Island
(617) 664-5928
Vermont, New Hampshire, and Maine (617) 664-5932
Massachusetts (617) 664-5968

Martindale Distribution, Inc. can be reached at (617) 664-0355.

Metro New York/Northern New Jersey

M&D Sales Company (an affiliate of the Miller & Dietz Company) has been representing Pro-Log in the Middle Atlantic region and now expands its coverage to northern New Jersey and the metropolitan New York area.

Direct your inquiries to George Rosazza at (201) 652-0009.

International Pricing

Prices quoted in this issue are domestic prices only. International customers should contact their distributor for pricing information. A list of international distributors is included on the back cover.

TRADEMARKS

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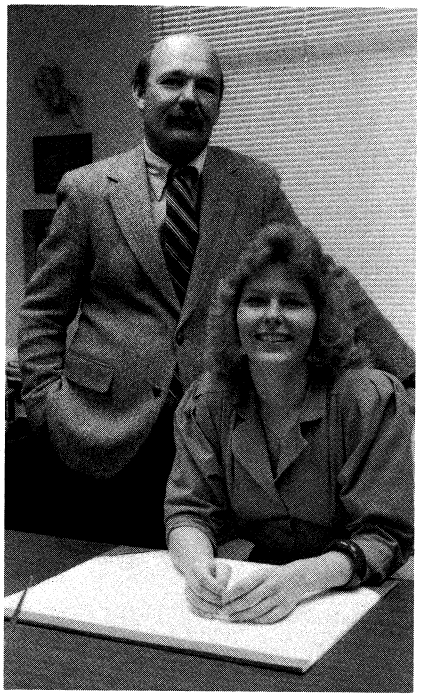
Pro-Log Goes Direct in Northern California & Northern Nevada

Effective in January, Pro-Log changed the Sales and Applications support in Northern California and Northern Nevada from a representative organization, MANCO, to direct support by Pro-Log staff.



Howard James and Carol Ann Glomb

On February 1, Pro-Log formally opened a new office at 985 University Avenue, Los Gatos, California 93930. Pro-Log's direct sales team -- Howard James, Regional Sales Manager, and John Stone, Field Applications Engineer -- are working out of the new office. Carol Ann Glomb, Sales Assistant, is supporting this office working out of Pro-Log in Monterey, California. You can contact the Northern California office at (800) 538-9570.

MANCO is still a leading Distributor of Pro-Log products and will continue to provide customers with local stocking, rapid delivery, and distribution support for STD BUS products from Pro-Log and other companies.

PRO-LOG REGIONAL OFFICES

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(800) 845-4463 Outside Georgia

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TWX: 910-360-7082
FAX 408-646-3517

NORTHERN CA & NORTHERN NV
PRO-LOG CORPORATION
Direct Sales Office
(800) 538-9570

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(213) 598-9645
Solana Beach, CA (619) 755-4703

ADTECH
Honolulu, HI (808) 941-0708

CASCADE DATA MARKETING
Beaverton, OR (503) 641-9266
Bellevue, WA (206) 747-6190

DYTEC/CENTRAL, INC.
Arlington Heights, IL (312) 394-3380
Brookfield, WI (414) 792-0320
Indianapolis, IN (317) 247-1316

DYTEC/SOUTH, INC.
Maryland Heights, MO (314) 569-2990
Lenexa, KS (913) 888-0215
Wichita, KS (316) 945-7090

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ADVANCED DIGITAL GROUP
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(213) 598-9645

EQS SYSTEMS
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Southwest OH/KY (513) 236-7676
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